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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/661,651  
Applicant : DAVIS, *et al.*  
Filed : SEPTEMBER 12, 2003  
Title : CHEMICAL MILLING OF GAS TURBINE ENGINE BLISKS

Art Unit : 1763  
Examiner : CULBERT, ROBERT P.

Atty Docket No. : 13DV13813-5

Mail Stop: Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The below-identified communication(s) is (are) submitted in the above-captioned application or proceeding:

- ☒ Appellant Rebuttal Brief
- ☒ Rebuttal Brief Fee Transmittal

- ☒ The Commissioner is hereby authorized to charge payment of any fees associated with this communication, including fees under 37 C.F.R. §§ 1.16 and 1.17 or credit any overpayment to **Deposit Account Number 10-0233-GEAE-0024-CP1**.

Respectfully submitted,

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July 3, 2006



# Patent Fee Transmittal for FY 2006

☐ Applicant(s) Claims Small Entity Status 37 C.F.R. 1.27

**TOTAL AMOUNT OF PAYMENT**

**\$0.00**

Application No. 10/661,651  
Filing Date 12-Sep-03  
Named Inventor DAVIS, et al.  
Examiner Name CULBERT, Robert P.  
Art Unit 1763  
Attorney Docket No. 13DV13813-5

## FEE CALCULATION

### 1. Filing Fees

Application Type	Description	Large Entity		Small Entity		Paid
		Code	(\$)	Code	(\$)	
Utility	<input type="checkbox"/> Basic	1011	300	2011	150	\$ -
	<input type="checkbox"/> Examination	1311	200	2311	100	\$ -
	<input type="checkbox"/> Search	1111	500	2111	250	\$ -
Design	<input type="checkbox"/> Basic	1012	200	2012	100	\$ -
	<input type="checkbox"/> Examination	1312	130	2312	65	\$ -
	<input type="checkbox"/> Search	1112	100	2112	50	\$ -
Plant	<input type="checkbox"/> Basic	1013	200	2013	100	\$ -
	<input type="checkbox"/> Examination	1313	160	2313	80	\$ -
	<input type="checkbox"/> Search	1113	300	2113	150	\$ -
Reissue	<input type="checkbox"/> Basic	1014	300	2014	150	\$ -
	<input type="checkbox"/> Examination	1114	600	2114	300	\$ -
	<input type="checkbox"/> Search	1314	500	2314	250	\$ -
Provisional	<input type="checkbox"/> Basic	1005	200	2005	100	\$ -
National Stage	<input type="checkbox"/> Basic	1631	300	2631	150	\$ -
	<input type="checkbox"/> Examination	1633	200	2633	100	\$ -
	<input type="checkbox"/> Search	1632	500	2632	250	\$ -

### 2. Extra Claim Fee

#### a. Claims as Filed

		Extra Claims	
Total Claims	0	- 20 =	0
Independent	0	- 3 =	0
Multiple Dependent			

Large Entity		Small Entity		Paid
Code	(\$)	Code	(\$)	
1201	50	2201	25	\$ -
1202	200	2202	100	\$ -
1203	360	2203	180	\$ -

#### b. Claims as Amended

		Present Extra	
Total Claims	0	- Highest Paid	0
Independent	0	- **	0
First Presentation of Multiple Dependent			

Large Entity		Small Entity		Paid
Code	(\$)	Code	(\$)	
1201	50	2201	25	\$ -
1202	200	2202	100	\$ -
1203	360	2203	180	\$ -

### 3. Extra Page Fee

		Extra Pages	
Total Pages	0	- 100	0

Large Entity		Small Entity		Paid
Code	(\$)	Code	(\$)	
1081	250	2081	125	\$ -

#### Subtotal for Application Fees

1	\$ -	+	2	\$ -	+	3	\$ -	=	\$ -
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### 4. Additional Fees

Description	Large Entity		Small Entity		Paid
	Code	(\$)	Code	(\$)	
Extension for response first month	1251	120	2251	60	\$ -
Extension for response second month	1252	450	2252	225	\$ -
Extension for response third month	1253	1,020	2253	510	\$ -
Extension for response fourth month	1254	1,590	2254	795	\$ -
Extension for response fifth month	1255	2,160	2255	1,080	\$ -
Notice of Appeal	1401	500	2401	250	\$ -
Filing a Brief in Support of an Appeal	1402	500	2402	250	\$ -
Request for Oral hearing	1403	1,000	2403	500	\$ -
Petitions under 1.17(f)	1462	400	2462	400	\$ -
Petitions under 1.17(g)	1463	200	2463	200	\$ -
Petitions under 1.17(h)	1464	130	2464	130	\$ -
Petition - public use proceeding	1451	1,510	2451	1,510	\$ -
Petition to Revoke - Unavoidable	1452	500	2452	250	\$ -
Petition to Revoke - Unintentional	1453	1,500	2453	750	\$ -
Utility Issue Fee	1501	1,400	2501	700	\$ -
Design Issue Fee	1502	800	2502	400	\$ -
Plant Issue Fee	1503	1,100	2503	550	\$ -
Reissue Issue Fee	1511	1,400	2511	700	\$ -
Publication Fee	1504	300	2504	300	\$ -
Statutory Disclaimer	1814	130	2814	65	\$ -

(cont.)

Description (cont.)	Large Entity		Small Entity		Paid
	Code	(\$)	Code	(\$)	
Recording each Assignment	8021	40	8021	40	\$ -
Submission of IDS	1806	180	1806	180	\$ -
Request for Cont. Examination (RCE)	1801	790	2801	395	\$ -
Filing Submission After Final	1809	790	2809	395	\$ -
Surcharge - late filing fee or oath	1051	130	2051	65	\$ -
Surcharge - late provisional fee	1052	50	2052	25	\$ -
Non-English Specification	1053	130	2053	130	\$ -
Processing Fee 37 CFR 1.17(q)	1807	50	2807	50	\$ -
Request for Ex Parte Reexamination	1812	2,520	2812	2,520	\$ -
Request Pub. of SIR prior to action	1804	920	2804	920	\$ -
Request Pub. of SIR after action	1805	1,840	2805	1,840	\$ -
Each Add. Invention Examined	1810	790	2810	395	\$ -
Expedited Examination (Design)	1802	900	2802	900	\$ -
Unintentionally Delayed Priority Claim	1453	1,370	2453	1,370	\$ -
Certificate of Correction	1811	100	2811	100	\$ -
Maintenance Fees 3.5 years	1551	900	2551	450	\$ -
Maintenance Fees 7.5 years	1552	2,300	2552	1,150	\$ -
Maintenance Fees 11.5 years	1553	3,800	2553	1,900	\$ -
Surcharge - Late Payment 6 mos.	1554	130	2554	65	\$ -
Other fee					\$ -

Additional Fee Subtotal 4 \$ -

### METHOD OF PAYMENT (Check all that apply)

☐ Credit Card (Provide credit card information and authorization on PTO-2038)

☒ Deposit Account No. 10-0233-GEAE-0024-CP1

For the above-identified deposit account, the Director is hereby authorized to:

☐ To charge the above-identified fee.

☒ To charge any additional fees which may be required under 37 CFR 1.16, 1.17, 1.18, 1.20 and 1.492 or credit any overpayment to the deposit account number listed above.

Submitted by:

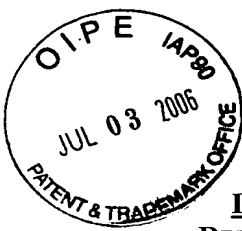
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*Eric W. Gutttag*

Signature

July 3, 2006

Date



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application No. : 10/661,651  
Applicant : BRIAN MICHAEL DAVIS ET AL.  
Filed : SEPTEMBER 12, 2003  
Title : CHEMICAL MILLING OF GAS TURBINE ENGINE BLISKS

Art Unit : 1763  
Examiner : ROBERT P. CULBERT

Atty Docket No. : 13DV13813-5

Mail Stop: Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**APPELLANTS REBUTTAL BRIEF UNDER 37 CFR 41.71(a)**

Sir:

Appellants have received the Examiner's Answer mailed June 7, 2006, in response to Appellants Brief for the above application. Pages 2-6 of Section 9 (Grounds of Rejection) of the Examiner's Answer have been previously addressed at pages 3-15 of Appellants Brief. Appellants are timely submitting this Rebuttal Brief solely in response to pages 7-10 of Section 10 (Response to Arguments) of the Examiner's Answer.

**SUMMARY OF THE INVENTION**

For the Board's convenience, Appellants' claimed invention relates to a method for selective chemical milling of a rotationally imbalanced gas turbine engine blisk 10 having a hub 14 and a plurality of metal blades 18 spaced circumferentially around hub 14 and extending radially outwardly therefrom, wherein at least one blade 18 is selectively treated with a chemical etchant for a period of time sufficient to change at least one of the chord 46 or thickness 50 so that blisk 10 is rotationally balanced (see, for example, Claims 1 and 9). See paragraphs [0010], [0019]-[0021], and [0023]-[0025] at pages 4 and 6-9 of the above application, as well as FIGS. 1-3 and 5 of the drawings. Prior to selective treatment with the chemical etchant, the rotationally imbalanced blisk may be evaluated to determine the direction and magnitude of the rotational imbalance, and to identify and determine which blade(s) 18 is to be treated with the chemical etchant to correct the rotational

imbalance of the blisk (see Claim 9); if the blisk is determined not to be rotationally balanced after treatment, the evaluation, identification and determination steps may be repeated (see Claim 10). See paragraphs [0011] and [0023]-[0024] at pages 4-5 and 8-9 of the above application, and steps 101-103 and 105-106 of FIG. 5.

The chemical etchant may be an aqueous etchant solution comprising at least one strong acid such hydrofluoric acid, nitric acid, hydrochloric acid, or sulfuric acid (see Claims 2-4 and 11-13). See paragraph [0026] at pages 10-11 of the above application. The selective treatment step may comprise immersing blades 18 (see blades 118-518 of FIG. 3) in the etchant solution 64 where blade(s) 18 not to be treated are provided prior to treatment with a chemically resistant maskant applied to the surface, with optional removal of the maskant to subsequently treat the untreated blade(s) 18 with the etchant solution 64 (see Claims 5-7 and 14-16). Alternatively, only blade(s) 18 to be treated are selectively immersed in the etchant solution until the blisk is rotationally balanced (see Claim 17). See paragraphs [0029]-[0030] and [0034] at pages 12-14 of the above application. A reference panel 64 may be used to monitor the degree of change in the chord 46/thickness 50 of blade 18 and the degree of hydrogen absorption by the metal of blade(s) 18 (see Claim 8 and 18-20). See paragraphs [0031]-[0032] at pages 13-14 of the above application, and FIG. 3.

#### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

For the Board's convenience, there are four grounds of rejection for which review has been requested on this appeal. The first ground of rejection is whether Claims 1 and 9-10 are unpatentable under 35 U.S.C. § 103(a) over the alleged "admitted prior art" (hereafter referred to as "APA") at paragraphs [0002]-[0008] of the above application, or alternatively over U.S. Patent 6,077,002 (hereafter referred to as "Lowe"), in view of Walker, *Machining Fundamentals* (hereafter referred to as "Walker"). The second ground of rejection is whether Claims 2-4 and 11-13 are unpatentable under 35 U.S.C. § 103(a) over the alleged APA, or alternatively over Lowe, in view of Walker, and further in view of U.S. Patent 4,534,823 (hereafter referred to as "Fishter et al."). The third ground of rejection is whether Claims 5-7 and 14-17 are unpatentable under 35 U.S.C. § 103(a) over the alleged APA, or alternatively over Lowe, in view of Walker, in view of Fishter et al., and further in view of U.S. Patent 5,126,005 (hereafter referred to as "Blake"). The fourth

ground of rejection is whether Claims 8 and 18-20 are unpatentable under 35 U.S.C. § 103(a) over the alleged APA, or alternatively over Lowe, in view of Walker, in view of Fishter et al., and further in view of U.S. Patent 5,259,920 (hereafter referred to as “Law”).

**APPELLANTS’ RESPONSE TO SECTION 10 OF THE EXAMINER’S ANSWER**

**A. REJECTION OF CLAIMS 1 AND 9-10 UNDER 35 USC § 103(a) AS UNPATENTABLE OVER ALLEGED APA, OR ALTERNATIVELY OVER LOWE, IN VIEW OF WALKER**

There are basically five points presented at pages 7-9 of Section 10 of the Examiner’s Answer that necessitate an additional response by Appellants regarding the rejection of Claims 1 and 9-10 under 35 USC § 103(a) as unpatentable over the alleged APA, or alternatively over Lowe, in view of Walker. These points relate to: (1) Appellants’ position that the alleged APA and Lowe do not teach or suggest treating at least one blade of a rotationally imbalanced blisk with a chemical etchant to provide a rotationally balanced blisk; (2) Appellants’ position that the alleged APA does not teach or suggest steps (a) through (d) of Claim 9; (3) Appellants’ position that the alleged APA does not teach or suggest steps (e) or (f) of Claim 10; (4) Appellants’ position that Walker does not teach or suggest chemical milling of the blades of a rotationally imbalanced blisk to achieve rotational balance of the blisk; and (5) Appellants’ position that there is no properly alleged motivation for combining the teachings of Walker with either the alleged APA or Lowe.

**1. IN ARGUING THAT THE ALLEGED APA AND LOWE DO NOT TEACH OR SUGGEST TREATING AT LEAST ONE BLADE OF A ROTATIONALLY IMBALANCED BLISK WITH A CHEMICAL ETCHANT TO PROVIDE A ROTATIONALLY BALANCED BLISK, APPELLANTS ARE PROPERLY POINTING OUT THE ADMITTED AND CONCEDED DEFICIENCIES IN THE TEACHINGS OF THESE PRIMARY REFERENCES.**

As was pointed out in Appellants Brief (see pages 4-5) and as was conceded in the Final Office Action, neither the alleged APA, nor Lowe, teach treating at least one blade of a rotationally imbalanced blisk with a chemical etchant to provide a rotationally balanced blisk.

In response, page 7 of the Examiner’s Answer argues that “one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references,” citing *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981) and *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). But the cases of *In re Keller* and *In re Merck & Co.* are inapplicable because Appellants are simply pointing out the deficiencies in the teachings of the alleged APA, and Lowe, the primary references relied on in rejecting Claims 1 and 9-10. It is certainly proper for Appellants to point out these deficiencies in the primary references, especially since the Final Office Action admits and concedes that these deficiencies exist.

**2. APPELLANTS HAVE PROPERLY POINTED OUT THAT THE FINAL OFFICE ACTION FAILED TO SPECIFICALLY STATE, AS REQUIRED BY 37 CFR 1.104(C)(2), WHERE THE ALLEGED APA RELIED ON TAUGHT OR SUGGESTED ALL OF STEPS (a) THROUGH (d) OF CLAIM 9, AND IN FACT THE EXAMINER’S ANSWER STILL FAILS TO IDENTIFY WHERE AT LEAST STEPS (b) THROUGH (d) ARE ENTIRELY TAUGHT BY THE ALLEGED APA.**

Page 7 of the Examiner’s Answer correctly states that the alleged APA relied on in the Final Office Action in rejecting Claim 9 refers to paragraphs [0005]-[0008] of the above application (not just paragraphs [0005]-[0006] as was stated at page 5 of Appellants Brief). But as was properly pointed out in Appellants Brief (see page 5), the Final Office Action failed to specifically explain, as required by 37 CFR 1.104(c)(2), how what is described in the alleged APA is the equivalent of any or all of steps (a) through (d) of Claim 9. In fact, it is only in page 7 of the Examiner’s Answer that Appellants are finally apprised of the specific basis for rejecting Claim 9.

Page 7 of the Examiner’s Answer further alleges that “the fact that different wording is used to teach the balancing method is irrelevant.” But unless Appellants are apprised, as required by 37 CFR 1.104(c)(2), as to how that “different wording” corresponds to each of steps (a) through (d) of Claim 9, Appellants are left to improperly guess at what the basis for the rejection of Claim 9 is.

In fact, page 7 of the Examiner’s Answer has properly identified only step (a) of Claim 9 as corresponding to what is taught in paragraphs [0005]-[0008] of the above application. By contrast, step (b) of Claim 9 (identifying at least one blade of the rotationally imbalanced blisk for potential treatment with a chemical etchant to correct the rotational imbalance of the blisk) is not entirely taught in these paragraphs, nor is step (c) of Claim 9 (determining which of the at least one blade should be treated with the chemical

etchant to correct the rotational imbalance of the blisk) entirely taught in these paragraphs. In fact, the Examiner's Answer concedes that even step (d) of Claim 9 is not entirely taught by the alleged APA, but is instead taught by "combination with the teachings of Walker" which Appellants submit is erroneous for reasons presented below.

**3. WITHOUT ANY BASIS IN THE ART RELIED ON, THE EXAMINER'S ANSWER IMPROPERLY SUGGESTS THAT THE STEPS (e) AND/OR (f) OF CLAIM 10 ARE OBVIOUS.**

As was pointed out in Appellants Brief (see page 5) and as was even conceded in the Final Office Action, the alleged APA, even in view of Walker, does not teach steps (e) or (f) of Claim 10.

In response, pages 7-8 of the Examiner's Answer state that Claim 10 "merely recites determining if the blisk is balanced and repeating the balancing process" and that "since it is the object of Lowe and the APA to balance a blisk to a desired tolerance, and the APA teaches that conventional balancing machines are used to determine the amount of rotational imbalance of a blisk, it would be obvious to one of ordinary skill the art to determine the amount of rotational imbalance using the conventional machines, and to perform additional balancing if the desired balance is not achieved."

This response at pages 7-8 of the Examiner's Answer provides absolutely nothing which addresses the thoroughly improper basis in the Final Office Action for rejecting Claim 10. The Examiner's Answer again makes an unsupported and conclusory argument that steps (e) and/or (f) of Claim 10 are obvious without any basis in the art relied on for where either of these steps are taught. This is contrary to the spirit, as well as the specific requirements, of 37 CFR 1.104(c)(2).

**4. THAT WALKER MAY TEACH THAT "CHEMICAL ETCHING PROVIDES FINE CONTROL (EXACTING TOLERANCES) OVER MECHANICAL MILLING" SUGGESTS NOTHING TO ONE SKILLED IN THE ART ABOUT USING CHEMICAL MILLING OF BLISK BLADES TO ACHIEVE ROTATIONAL BALANCE OF AN IMBALANCED BLISK, AND STILL DOES NOT ADDRESS WHAT IS IMPORTANT IN BALANCING A BLISK ACCORDING TO THE CLAIMED METHOD.**

As was pointed out in Appellants Brief (see pages 5-6), Walker only teaches the use of chemical milling to machine metal parts "to exacting tolerances" which is not what is important in creating rotationally balanced blisks. Put differently, blades having

“exacting tolerances” relative to each other is neither a necessary, nor sufficient, condition to achieve blisk balance. For example, the blades of the blisk could be exactly the same (*i.e.*, no blade-to-blade variation), but offset from the blisk centerline, thus making the blisk unbalanced.

In response, page 8 of the Examiner’s Answer says that “Walker does not teach that tolerances for etched parts must be exactly the same relative to each other, only that chemical etching provides fine control (exacting tolerances) over mechanical milling.” The Examiner’s Answer further alleges that Lowe teaches forming more exact dimensions using “additional milling” to improve balance (referring to column 2, lines 49-64 of Lowe) and also refers to the alleged APA as teaching that “the disadvantages of mechanical machining methods include the risk of damaging the blades or other portion of the blisk, the difficulty in finely controlling the changes in the chord and/or thickness of the blades.”

That Walker may teach that “chemical etching provides fine control (exacting tolerances over mechanical milling” as alleged by the Examiner’s Answer still fails to address why one skilled in the art would consider Walker relevant to achieving rotational balance of an imbalanced blisk using chemical milling. The references in the Examiner’s Answer to what Lowe and the alleged APA teach about mechanical milling also do not address why one skilled in the art would consider chemically milling, as taught by Walker, to be relevant in balancing rotationally imbalanced blisks according to the method of Claims 1 and 9-10. Again, what the method of Claims 1 and 9-10 does is to change the mass distribution of the blades through chemical milling to create a balanced blisk, even if those blades are not within “exacting tolerances.” This is simply not taught or suggested at all by Walker, Lowe or the alleged APA, either separately or in combination, with regard to chemical milling.

**5. THE MOTIVATION ALLEGED IN THE EXAMINER’S ANSWER FOR COMBINING THE TEACHINGS OF WALKER WITH EITHER THE ALLEGED APA OR LOWE DOES NOT PROPERLY ADDRESS WHY ONE SKILLED WOULD CONSIDER CHEMICAL MILLING, BASED ON WHAT WALKER TEACHES, RELEVANT TO THE PROBLEM OF ACHIEVING ROTATIONAL BALANCE OF AN IMBALANCED BLISK.**

As was pointed out in Appellants Brief (see pages 6-8), the Final Office Action fails to allege any proper motivation for combining the teachings of Walker with those of



the alleged APA and Lowe.

In response, page 8 of the Examiner's Answer alleges that the motivation to combine Lowe or the alleged APA with Walker is that the alleged APA and Lowe "teach fine adjustment in the dimensions of a metal workpiece to balance a blisk and Walker provides a suitable method for fine adjustment of the dimensions of a metal workpiece." The Examiner's Answer also alleges that "further motivation to use chemical etching as a removal technique is provided in Walker, (p. 516) such as lower tooling costs, no burrs formed, *etc.*"

This response in the Examiner's Answer still fails to allege any proper "motivation" to combine Walker with Lowe or the alleged APA. First, as was pointed out in Appellants Brief, the Examiner's Answer still states the alleged combination backwards relative to the proper legal standard for "motivation to combine." The alleged combination is Walker with Lowe or the alleged APA, and not Lowe or the alleged APA with Walker as is stated in the Examiner's Answer.

Second, what the Examiner's Answer alleges about Lowe and the alleged APA with regard "fine adjustment in the dimensions of a metal workpiece to balance a blisk" relates to mechanical milling, not chemical milling. In fact, the Final Office Action, as well as the Examiner's Answer, has failed to point to any art recognized equivalency between mechanical milling and chemical milling, especially with regard to balancing a rotationally imbalanced blisk.

Most importantly, the Examiner's Answer still fails address why one skilled in the art would even consider Walker relevant, based on what Walker teaches, to the problem of achieving rotational balance of an imbalanced blisk, which is the problem solved by chemical milling according to the method of Claims 1 and 9-10. As has been held by the Federal Circuit, "motivation to combine" requires that the nature of the problem to be solved would have led a person of ordinary skill in the art to combine the prior art teachings in the particular manner claimed to solve the same problem. *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998) ("In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements cited prior art references for combination in the manner claimed.") (emphasis added). The specific motivation alleged in the Examiner's Answer for combining Walker (*i.e.*, lower

tooling costs, no burrs formed) with Lowe and the alleged APA, based on what Walker allegedly teaches does not address the same problem solved by the method of Claims 1 and 9-10 (*i.e.*, balancing a rotational imbalanced blisk).

In fact, as was pointed out in Appellants Brief, nowhere does Walker teach that chemical milling can be used to achieve rotational balance of any part, much less a blisk. Instead, and as was correctly pointed out in Appellants Brief, all that Walker specifically exemplifies is the use of chemical milling with static non-rotating components which, unlike a blisk, do not require rotational balancing for successful operation. There is simply nothing specifically exemplified or taught in Walker that would motivate one skilled in the art to apply chemical milling to the problem of correcting rotational imbalances according to the method of Claims 1 and 9-10.

In response, page 9 of the Examiner's Answer alleges that Appellants characterization of Walker as not being directed at correcting rotational imbalances in blisks because Walker teaches static non-rotating components "is a piecemeal analysis of the references." But it is the Final Office Action, as well as the Examiner's Answer, which have provided a "piecemeal" and improper basis for combining Walker with Lowe or the alleged APA in rejecting Claims 1 and 9-10. The fact remains that the Final Office Action, as well as the Examiner's Answer, has provided absolutely no proper "motivation to combine" Walker with Lower or the alleged APA, to: (a) address the same problem solved by the method of Claims 1 and 9-10 through the use of chemical milling; (b) based on what Walker teaches about chemical milling.

**B. REJECTION OF CLAIMS 2-4 AND 11-13 UNDER 35 USC § 103(a) AS UNPATENTABLE OVER ALLEGED APA, OR ALTERNATIVELY OVER LOWE, IN VIEW OF WALKER, AND FURTHER IN VIEW OF FISHTER ET AL.**

There are basically two points presented at page 9 of Section 10 of the Examiner's Answer that necessitate an additional response by Appellants regarding the rejection of Claims 2-4 and 11-13 under 35 USC § 103(a) as unpatentable over the alleged APA, or alternatively over Lowe, in view of Walker, and further in view of Fishter et al. These points relate to: (1) the Appellants' position that there is no properly alleged motivation in Walker, the alleged APA or Lowe for why one skilled in the art would consider the teachings of Fishter et al. to be relevant; and (2) the Appellants' position that there is no

properly alleged motivation taught in Fishter et al. for combining the teachings of this reference with those of Walker, the alleged APA and Lowe.

**1. THE FINAL OFFICE ACTION NEVER STATES THAT THE COMBINATION OF FISHTER ET AL. WITH WALKER, THE ALLEGED APA OR LOWE CREATES PRIMA FACIE OBVIOUSNESS AND DOES NOT PROVIDE PROPER MOTIVATION TO COMBINE THESE REFERENCES TO SUPPORT PRIMA FACIE OBVIOUSNESS.**

As was pointed out in Appellants Brief (see pages 8-9), the Final Office Action fails to allege any proper motivation for combining the teachings of Fisher et al. with those of the alleged APA, Lowe and Walker.

In response, page 9 of the Examiner's Answer argues that the "selection of a known material based on suitability for its intended use supports a prima facie obviousness determination," citing the case of *In re Leshin*, 227 F.2d 197, 125 U.S.P.Q. 416 (CCPA 1960). But the Final Office Action never states that the rejection Claims 2-4 and 11-13 over the combination of references is based on *prima facie* obviousness. The case of *In re Leshin* is therefore completely inapplicable.

More significantly, no rejection of Claims 2-4 and 11-13 for *prima facie* obviousness is proper over this combination of references because, as stated in Appellants Brief, the Final Office Action fails to provide a properly alleged "motivation to combine" these references. The Federal Circuit has held that a rejection for *prima facie* obviousness based on a combination of references requires that there must be some proper motivation alleged for combining these references. See *In re Rouffet*, *supra*. Nowhere does the Examiner's Answer properly rebut the Appellants' position that the Final Office Action has alleged no proper "motivation" based on Walker, the alleged APA or Lowe for why one skilled in the art would consider the teachings of Fishter et al. to be relevant to the method of Claims 2-4 and 11-13.

**2. WHAT FISHTER ET AL. TEACHES ABOUT CHEMICAL MILLING WITH CHEMICAL ETCHANT ACIDS IS INADEQUATE TO SUGGEST THE USE OF THESE ACIDS IN THE METHOD OF CLAIMS 2-4 AND 11-13.**

As was pointed out in Appellants Brief (see page 9), there is no proper motivation taught in Fishter et al. for combining the teachings of this reference with those Walker, the alleged APA and Lowe according to the method of Claims 2-4 and 11-13.

In response, page 9 of the Examiner's Answer says that Fishter et al.'s alleged

teaching that the etchant “effectively etches and removes the metal material without intergranular or selective localized attack producing pitting or an uneven surface only supports its use as an etchant for turbine blade alloys.” But Examiner’s Answer still inaccurately characterizes what Fishter et al. teaches about use of these etchant acids relative to the method of Claims 2-4 and 11-13. Fishter et al. simply does not teach or suggest the use of these etchant acids to adjust the dimensions (*i.e.*, the chord and/or thickness) of blisk blades according to the method of Claims 2-4 and 11-13 to correct rotational imbalances in such blisks.

**C. REJECTION OF CLAIMS 5-7 AND 14-17 UNDER 35 USC §103(a) AS UNPATENTABLE OVER ALLEGED APA, OR ALTERNATIVELY OVER LOWE, IN VIEW OF WALKER, IN VIEW OF FISHTER ET AL., AND FURTHER IN VIEW OF BLAKE**

There are basically four points presented at page 10 of Section 10 of the Examiner’s Answer that necessitate an additional response by Appellants regarding the rejection of Claims 5-7 and 14-17 under 35 USC § 103(a) as unpatentable over the alleged APA, or alternatively over Lowe, in view of Walker, in view of Fishter et al., and further in view of Blake. These points relate to: (1) the Appellants’ position that no proper motivation has been alleged based on Fishter et al., Walker, the alleged APA or Lowe for why the teachings of Blake would be considered relevant; (2); the Appellants’ position that Blake does not teach or suggest selective application of a maskant to some of the blisk blades prior to immersion in the etchant solution, and especially for the purpose of correcting the rotational imbalance of a blisk; (3) the Appellants’ position that Blake does not teach or suggest removing the maskant from the untreated blisk blade and then reimmersing the treated and untreated blades in the etchant solution until the blisk is rotationally balanced according to Claims 7 and 16; and (4) the Appellants’ position that nowhere is it alleged in the Final Office Action where the combination of Blake, Fishter et al., Walker, the alleged APA or Lowe teaches or suggest immersing solely the treated blade(s) in the etchant solution to achieve rotational balance of the blisk according to Claim 17.

- 1. THE EXAMINER’S ANSWER ALLEGES MOTIVATION ONLY FOR COMBINING BLAKE WITH WALKER, BUT NOT BLAKE WITH THE ALLEGED APA OR LOWE.**

As was pointed out in Appellants Brief (see pages 10-11), the Final Office Action fails to allege any proper motivation for combining the teachings of Blake with those of Fishter et al., Walker, the alleged APA and Lowe.

In response, page 10 of the Examiner's Answer alleges that: (a) the alleged APA and Lowe teach selective material removal of material; (b) Walker further teaches that masking is a conventional part of chemical milling (referring to page 512); and (c) therefore one skilled in the art would look to the teachings of Blake, which allegedly providing suitable masking techniques and materials for selective chemical milling (etching) of a workpiece.

Appellants must initially point out that, unlike the Final Office Action or any prior Office Action, the Examiner's Answer, for the first time, relies on Walker to allegedly teach that "masking is a conventional part of chemical milling." Even so, the Examiner's Answer still fails to allege any proper motivation for combining the teachings of Blake with those of the alleged APA and Lowe. That the alleged APA and Lowe allegedly teach "selective material removal" still does not address why the alleged APA and Lowe, which are directed at mechanical milling and electrochemical milling, not chemical milling, would consider Blake's teachings on masking for chemical milling relevant.

**2. THAT BLAKE DOES NOT TEACH OR SUGGEST SELECTIVE APPLICATION OF A MASKANT TO SOME OF THE BLISK BLADES PRIOR TO IMMERSION IN THE ETCHANT SOLUTION, AND ESPECIALLY FOR THE PURPOSE OF CORRECTING THE ROTATIONAL IMBALANCE OF A BLISK, IS HIGHLY SIGNIFICANT AS TO WHY THE TEACHINGS OF BLAKE WOULD NOT BE CONSIDERED RELEVANT BY ONE SKILLED IN THE ART TO THE METHOD OF CLAIMS 5-7 AND 14-17.**

As was pointed out in Appellants Brief (see pages 11-12), Blake does not teach or suggest selective application of the maskant to some of the blisk blades prior to immersion in the etchant solution according to Claims 5-7 and 14-17. In particular, Blake does not teach or suggest selective application of the maskant to distinct parts of a component to be etched by chemical milling for the purpose of balancing that component, *i.e.*, correcting the rotational imbalance of a blisk according to Claims 5-7 and 14-17.

In response, page 10 of the Examiner's Answer alleges that is "piecemeal analysis of the rejection" because "Blake is not relied upon to teach correcting the rotational imbalance of the blisk." But rather than being "piecemeal analysis" of the rejection, what

Appellants have appropriately pointed out is a deficiency in the teachings of Blake which is highly significant as to whether one skilled in the art would consider this reference relevant to the method of Claims 5-7 and 14-17. The fact remains that Blake does not teach or suggest: (a) applying the maskant to distinct parts of the component to be etched by chemical milling; (b) for the purpose of balancing that component, *i.e.*, correcting the rotational imbalance of a blisk. Because Blake does not teach either (a) or (b), and especially does not teach (a) and (b) together, it is entirely speculative as to whether one skilled in the art would even consider Blake relevant to the method of Claims 5-7 and 14-17, *i.e.*, there is no proper “motivation to combine.”

**3. THAT BLAKE CONSIDERS THE CITED PRIOR ART PROCESS CONSISTING OF A PLURALITY OF MASKING, REMOVAL AND ETCHING STEPS AS NOT PROVIDING SUFFICIENT BENEFITS IS HIGHLY SIGNIFICANT AS TO WHY THE TEACHINGS OF BLAKE WOULD NOT BE CONSIDERED BY ONE SKILLED IN THE ART TO SUGGEST THE METHOD OF CLAIMS 7 AND 16.**

As was pointed out in Appellants Brief (see page 12), the cited prior art process in Blake (see column 1, lines 30-44) consisting of a plurality of masking, removal and etching steps is considered by Blake not to provide sufficient benefits (see column 1, lines 40-44), and thus Blake in no way teaches or suggests such reimmersion after removal of the maskant is desirable.

In response, page 10 the Examiner’s Answer alleges that “the prior art process remains a viable prior art process even after improvements have been made.” But the Examiner’s Answer cannot have it both ways by relying only on those portions of Blake that allegedly support the rejection in the Final Office Action, while ignoring or discounting other portions of Blake that do not. Because Blake considers this cited prior art process not to provide sufficient benefits, one skilled in the art would be far less likely to consider Blake relevant to the method Claims 7 or 16 where the maskant is removed from the untreated blisk blade(s), with the treated and untreated blisk blades then being reimmersed in the etchant solution until the blisk is rotationally balanced.

**4. THE EXAMINER’S ANSWER INTERPRETS THE METHOD DEFINED IN CLAIM 17 UNREASONABLY, ESPECIALLY IF CLAIM 17 IS TO BE CONSIDERED TO BE DIFFERENT IN SCOPE FROM CLAIM 11 FROM WHICH CLAIM 17 DEPENDS.**

As was pointed out in Appellants Brief (see pages 12-13), nowhere does the Final

Office Action allege where the combination of Blake, Fishter et al., Walker, the alleged APA or Lowe teaches or suggests immersing solely the treated blade(s) in the etchant solution to achieve rotational balance of the blisk according to Claim 17.

In response, page 10 of the Examiner's Answer alleges "the step of immersing solely the at least one blade to be treated reads broadly on the immersion of any number of blades since any blades that are immersed are effectively treated as broadly claimed by appellant." But contrary to what the Examiner's Answer suggests, the Final Office Action never specifically addresses how the combination of references relied on are applied to the method of Claim 17. Moreover, the Examiner's Answer interprets the method defined by Claim 17 unreasonably, especially if Claim 17 is to be considered different in scope from Claim 11 from which Claim 17 depends. Implicit in "selectively immersing solely the at least one blade to be treated" according to Claim 17 is that there are other untreated blades of the blisk that are not immersed. See also the description in paragraph [0034] at page 14 of the above application which supports Appellants' reading of Claim 17.

**D. REJECTION OF CLAIMS 8 AND 18-20 UNDER 35 USC § 103(a) AS UNPATENTABLE OVER ALLEGED APA, OR ALTERNATIVELY OVER LOWE, IN VIEW OF WALKER, IN VIEW OF FISHTER ET AL., AND FURTHER IN VIEW OF LAW**

There are basically two points presented at page 10 of Section 10 of the Examiner's Answer that necessitate an additional response by Appellants regarding the rejection of Claims 8 and 18-20 under 35 USC § 103(a) as unpatentable over the alleged APA, or alternatively over Lowe, in view of Walker, in view of Fishter et al., and further in view of Law. These points relate to: (1) the Appellants' position that no proper motivation has been alleged based on Fishter et al., Walker, the alleged APA or Lowe for why the teachings of Law would be considered relevant, or based on Law for combining the teachings of this reference with those of Walker, the alleged APA and Lowe; and (2) the Appellants' position that etching a pattern according to Law is not the same or equivalent to changing the dimensions of a part according to the method of Claims 8 and 18-20.

**1. THE EXAMINER'S ANSWER STILL FAILS TO ALLEGE ANY PROPER MOTIVATION TO COMBINE THE TEACHINGS OF LAW WITH THOSE OF FISHTER ET AL., WALKER, THE ALLEGED APA OR LOWE.**

As was pointed out in Appellants' Brief (see pages 13-14), the Final Office Action

fails to allege any proper motivation for combining the teachings of Law with those of Fishter et al., Walker, the alleged APA and Lowe. In particular, the Final Office Action alleges no proper “motivation” based on Fishter et al, Walker, the alleged APA, or Lowe for why one skilled in the art would consider the teachings of Law to be relevant, as well as no proper “motivation” based on what is taught in Law for combining the teachings of this reference with those Fishter et al., Walker, the alleged APA and Lowe.

Page 10 of Examiner’s Answer still provides absolutely no properly alleged “motivation” for combining these references in rejecting Claims 8 and 18-20. In fact, page 10 of the Examiner’s Answer provides no response at all to Appellant’s position that there is no properly alleged “motivation” based on: (1) Fishter et al, Walker, the alleged APA, or Lowe for why one skilled in the art would consider the teachings of Law to be relevant; or (2) Law for combining the teachings of this reference with those Fishter et al., Walker, the alleged APA and Lowe.

**2. “ETCHING A PATTERN” IN A CONDUCTIVE LAYER OF A CIRCUIT BOARD ACCORDING TO LAW IS NOT THE SAME OR EQUIVALENT TO “CHANGING THE DIMENSIONS” OF BLISK BLADES ACCORDING TO THE METHOD OF CLAIMS 8 AND 18-20.**

As was pointed out in Appellants Brief (see page 14), the Law process is directed at monitoring the etching of a pattern in the electronically conductive layer of a circuit board, rather than monitoring the change in dimensions of the shape of a part. See column 1, lines 12-17. In other words, etching a pattern in the part according to Law is not the same or equivalent to changing the dimensions of the part according to the method Claims 8 and 18-20.

In response, page 10 of the Examiner’s Answer maintains that “etching a pattern of a part clearly changes the dimensions of that part.” But when considered in the appropriate context, “etching a pattern” in the conductive layer of a circuit board according to Law is in no way the same or equivalent to “changing the dimensions” (*i.e.*, the chord and/or thickness) of blisk blades according to the method of Claims 8 and 18-20.

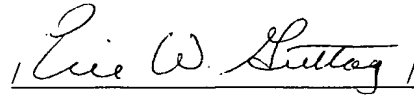
**CONCLUSIONS AND RELIEF REQUESTED**

Based on the arguments presented in Appellants Brief and the present Rebuttal Brief, it is respectfully submitted that the method of Claims 1-20 is unobvious over the



combined prior art relied on in rejecting these Claims. Accordingly, Appellants respectfully request the Honorable Board of Appeals and Interferences to reverse the Examiner's rejections in the Final Office Action and remand with directions to allow the above application to issue with Claims 1-20 currently pending.

Respectfully submitted,  
For: Brian Michael DAVIS et al.

A handwritten signature in cursive script, reading "Eric W. Gutttag", is written over a horizontal line.

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